

CLAIMS

What is claimed is:

1. An isolated polynucleotide that encodes a polypeptide comprising a sequence of amino acid residues that is at least 90% identical to an amino acid sequence selected from the group consisting of:

- (a) the amino acid sequence as shown in SEQ ID NO:2 from amino acid number 32 (His), to amino acid number 253 (Phe); and
- (b) the amino acid sequence as shown in SEQ ID NO:2 from amino acid number 1 (Met), to amino acid number 253 (Phe); and
- (c) a polynucleotide sequence complementary to (a) or (b).

2. An isolated polynucleotide according to claim 1, wherein the polynucleotide is selected from the group consisting of:

- (a) a polynucleotide sequence as shown in SEQ ID NO:1 from nucleotide 298 to nucleotide 962;
- (b) a polynucleotide sequence as shown in SEQ ID NO:1 from nucleotide 205 to nucleotide 962; and
- (c) a polynucleotide sequence complementary to (a) or (b).

3. An isolated polynucleotide sequence according to claim 1, wherein the polynucleotide comprises nucleotide 94 to nucleotide 759 of SEQ ID NO:5.

4. An isolated polynucleotide according to claim 1, wherein the polypeptide comprises a sequence of amino acid residues selected from the group consisting of:

- (a) the amino acid sequence as shown in SEQ ID NO:2 from amino acid number 32 (His), to amino acid number 253 (Phe); and
- (b) the amino acid sequence as shown in SEQ ID NO:2 from amino acid number 1 (Met), to amino acid number 253 (Phe); and

(c) a polynucleotide sequence complementary to (a) or (b).

5. An expression vector comprising the following operably linked elements:

a transcription promoter;

a DNA segment encoding a polypeptide as shown in SEQ ID NO:2 from amino acid number 32 (His), to amino acid number 253 (Phe); and

a transcription terminator,

wherein the promoter is operably linked to the DNA segment, and the DNA segment is operably linked to the transcription terminator.

6. An expression vector according to claim 5, further comprising a secretory signal sequence operably linked to the DNA segment.

7. A cultured cell comprising an expression vector according to claim 5, wherein the cell expresses a polypeptide encoded by the DNA segment.

8. A DNA construct encoding a fusion protein, the DNA construct comprising:

a first DNA segment encoding a polypeptide comprising a sequence of amino acid residues selected from the group consisting of:

(a) the amino acid sequence as shown in SEQ ID NO:2 from amino acid number 1 (Met), to amino acid number 31 (Leu);

(b) the amino acid sequence as shown in SEQ ID NO:4 from amino acid number 1 (Met), to amino acid number 27 (Arg);

(c) the amino acid sequence as shown in SEQ ID NO:2 from amino acid number 42 (Leu), to amino acid number 56 (Ile);

(d) the amino acid sequence as shown in SEQ ID NO:2 from amino acid number 108 (Tyr), to amino acid number 122 (Thr);

(e) the amino acid sequence as shown in SEQ ID NO:2 from amino acid number 151 (Ile), to amino acid number 165 (Gln);

(f) the amino acid sequence as shown in SEQ ID NO:2 from amino acid number 213 (Ile), to amino acid number 227 (Ala);

(g) the amino acid sequence as shown in SEQ ID NO:2 from amino acid number 42 (Ile), to amino acid number 227 (Ala);

(h) the amino acid sequence as shown in SEQ ID NO:2 from amino acid number 32 (His), to amino acid number 253 (Phe); and

at least one other DNA segment encoding an additional polypeptide, wherein the first and other DNA segments are connected in-frame; and wherein the first and other DNA segments encode the fusion protein.

9. An expression vector comprising the following operably linked elements:

a transcription promoter;

a DNA construct encoding a fusion protein according to claim 8; and

a transcription terminator,

wherein the promoter is operably linked to the DNA construct, and the DNA construct is operably linked to the transcription terminator.

10. A cultured cell comprising an expression vector according to claim 9, wherein the cell expresses a polypeptide encoded by the DNA construct.

11. A method of producing a fusion protein comprising:

culturing a cell according to claim 10; and

isolating the polypeptide produced by the cell.

12. An isolated polypeptide comprising a sequence of amino acid residues that is at least 90% identical to an amino acid sequence selected from the group consisting of:

(a) the amino acid sequence as shown in SEQ ID NO:2 from amino acid number 32 (His), to amino acid number 253 (Phe); and

(b) the amino acid sequence as shown in SEQ ID NO:2 from amino acid number 1 (Met), to amino acid number 253 (Phe).

13. An isolated polypeptide according to claim 12, wherein the polypeptide comprises a sequence of amino acid residues selected from the group consisting of:

- (a) the amino acid sequence as shown in SEQ ID NO:2 from amino acid number 32 (His), to amino acid number 253 (Phe); and
- (b) the amino acid sequence as shown in SEQ ID NO:2 from amino acid number 1 (Met), to amino acid number 253 (Phe).

14. A method of producing a polypeptide comprising:

culturing a cell according to claim 7; and

isolating the polypeptide produced by the cell.

15. A method of producing an antibody comprising:

inoculating an animal with a polypeptide selected from the group consisting

of:

- (a) a polypeptide according to claim 13;
- (b) a polypeptide comprising the amino acid sequence of SEQ ID NO:2 from amino acid number 42 (Leu), to amino acid number 56 (Ile);
- (c) a polypeptide comprising the amino acid sequence of SEQ ID NO:2 from amino acid number 108 (Tyr), to amino acid number 122 (Thr);
- (d) a polypeptide comprising the amino acid sequence of SEQ ID NO:2 from amino acid number 151 (Ile), to amino acid number 165 (Gln);
- (e) a polypeptide comprising the amino acid sequence of SEQ ID NO:2 from amino acid number 213 (Ile), to amino acid number 227 (Ala);
- (f) a polypeptide comprising the amino acid sequence of SEQ ID NO:2 from amino acid number 42 (Ile), to amino acid number 227 (Ala);
- (g) a polypeptide comprising the amino acid sequence of SEQ ID NO:2 from amino acid number 34 (Gln) to amino acid number 39 (Arg);
- (h) a polypeptide comprising the amino acid sequence of SEQ ID NO:2 from amino acid number 59 (Asn) to amino acid number 64 (Asp);

(i) a polypeptide comprising the amino acid sequence of SEQ ID NO:2 from amino acid number 63 (Lys) of SEQ ID NO:2; and (4) amino acid number 116 (Gly);

(j) a polypeptide comprising the amino acid sequence of SEQ ID NO:2 from amino acid number 58 (Ala) to amino acid number 121 (Glu);

(k) a polypeptide comprising the amino acid sequence of SEQ ID NO:2 from amino acid number 101 (Glu) to amino acid number 107 (Leu);

(l) a polypeptide comprising the amino acid sequence of SEQ ID NO:2 from amino acid number 162 (Thr) to amino acid number 169 (Glu);

(m) a polypeptide comprising the amino acid sequence of SEQ ID NO:2 from amino acid number 194 (Lys) to amino acid number 200 (Leu);

(n) a polypeptide comprising the amino acid sequence of SEQ ID NO:2 from amino acid number 218 (Cys) to amino acid number 225 (Asp);

(o) a polypeptide comprising the amino acid sequence of SEQ ID NO:2 from amino acid number Ala (249) to amino acid number 252 (Arg); and

wherein the polypeptide elicits an immune response in the animal to produce the antibody; and

isolating the antibody from the animal.

16. An antibody produced by the method of claim 15, which binds to a polypeptide as shown in SEQ ID NO:2 from amino acid 32-353.

17. The antibody of claim 16, wherein the antibody is a monoclonal antibody.

18. An antibody that specifically binds to a polypeptide of claim 13.

19. A method of detecting, in a test sample, the presence of an antagonist of zlmda24 protein activity, comprising:

culturing a cell that is responsive to a zlmda24-stimulated cellular pathway; and

producing a zlmda24 polypeptide by the method of claim 14; and

exposing the zlmda24 polypeptide to the cell, in the presence and absence of a test sample; and

comparing levels of response to the zlmda24 polypeptide, in the presence and absence of the test sample, by a biological or biochemical assay; and

determining from the comparison, the presence of the antagonist of zlmda24 activity in the test sample.

20. A method of detecting, in a test sample, the presence of an agonist of zlmda24 protein activity, comprising:

culturing a cell that is responsive to a zlmda24-stimulated cellular pathway; and

adding a test sample; and

comparing levels of response in the presence and absence of the test sample, by a biological or biochemical assay; and

determining from the comparison, the presence of the agonist of zlmda24 activity in the test sample.

21. A method for detecting a genetic abnormality in a patient, comprising:

obtaining a genetic sample from a patient;

producing a first reaction product by incubating the genetic sample with a polynucleotide comprising at least 14 contiguous nucleotides of SEQ ID NO:1 or the complement of SEQ ID NO:1, under conditions wherein said polynucleotide will hybridize to complementary polynucleotide sequence;

visualizing the first reaction product; and

comparing said first reaction product to a control reaction product from a wild type patient, wherein a difference between said first reaction product and said control reaction product is indicative of a genetic abnormality in the patient.

22. A method for detecting testis tissue in a patient sample, comprising:

obtaining a tissue or biological sample from a patient;

incubating the tissue or biological sample with an antibody of claim 18 under conditions wherein the antibody binds to its complementary polypeptide in the tissue or biological sample;

visualizing the antibody bound in the tissue or biological sample; and

comparing levels and localization of antibody bound in the tissue or biological sample from the patient to a non-testis control tissue or biological sample,

wherein an increase in the level or localization of antibody bound to the patient tissue or biological sample relative to the non-testis control tissue or biological sample is indicative of testis tissue in a patient sample.

23. A method for detecting a testicular cancer in a patient, comprising:

obtaining a tissue or biological sample from a patient;

incubating the tissue or biological sample with an antibody of claim 18 under conditions wherein the antibody binds to its complementary polypeptide in the tissue or biological sample;

visualizing the antibody bound in the tissue or biological sample; and

comparing levels of antibody bound in the tissue or biological sample from the patient to a normal control tissue or biological sample,

wherein an increase in the level of antibody bound to the patient tissue or biological sample relative to the normal control tissue or biological sample is indicative of a testicular cancer in the patient.

24. A method for detecting testis tissue in a patient sample, comprising:

obtaining a tissue or biological sample from a patient;

labeling a polynucleotide comprising at least 14 contiguous nucleotides of SEQ ID NO:1 or the complement of SEQ ID NO:1;

incubating the tissue or biological sample with under conditions wherein the polynucleotide will hybridize to complementary polynucleotide sequence;

visualizing the labeled polynucleotide in the tissue or biological sample; and

comparing the level and localization of labeled polynucleotide hybridization in the tissue or biological sample from the patient to a control non-testis tissue or biological sample,

wherein an increase in the level or localization of the labeled polynucleotide hybridization to the patient tissue or biological sample relative to the control non-testis tissue or biological sample is indicative of testis tissue in a patient sample.

25. A method for detecting a testicular cancer in a patient, comprising:

- obtaining a tissue or biological sample from a patient;
- labeling a polynucleotide comprising at least 14 contiguous nucleotides of SEQ ID NO:1 or the complement of SEQ ID NO:1;
- incubating the tissue or biological sample with under conditions wherein the polynucleotide will hybridize to complementary polynucleotide sequence;
- visualizing the labeled polynucleotide in the tissue or biological sample; and
- comparing the level of labeled polynucleotide hybridization in the tissue or biological sample from the patient to a normal control tissue or biological sample,

wherein an increase in the labeled polynucleotide hybridization to the patient tissue or biological sample relative to the normal control tissue or biological sample is indicative of a testicular cancer in the patient.